

Nomenclature in gas industry

Absorber tower or column that provides contact between natural gas being processed and a liquid solvent.

Absorption The operation in which one or more components in the gas phase are transferred to (absorbed into) a liquid solvent.

absorption factor A factor which is an indication of the tendency for a given gas phase component to be transferred to the liquid solvent. It is generally expressed as $A = L/KV$ where L and V are the moles of liquid and vapor, and K is the average value of the vapor liquid equilibrium constant for the component of concern.

absorption oil A hydrocarbon liquid used to absorb and recover components from the natural gas being processed.

acid gas The hydrogen sulfide and/or carbon dioxide contained in, or extracted from, gas or other streams.

adiabatic expansion The expansion of a gas, vapor, or liquid stream from a higher pressure to a lower pressure in which there is no heat transfer between the gas, vapor, or liquid and the surroundings.

Adsorbent A solid substance used to remove components from natural gas being processed.

Adsorption The process by which gaseous components are adsorbed on solids because of their molecular attraction to the solid surface.

amine (alkanolamine) Any of several liquid compounds containing amino nitrogen generally used in water solution to remove, by reversible chemical reaction, hydrogen sulfide and/or carbon dioxide from gas and liquid hydrocarbon streams.

API Gravity An arbitrary scale expressing the relative density of liquid petroleum products. The scale is calibrated in degrees API, calculated by the following formula:

$$\text{Deg API} = \left[\frac{141.5}{\text{Rel Den (15.56°C/15.56°C)}} \right] - 131.5$$

associated gas Gaseous hydrocarbons occurring as a free-gas phase under original oil-reservoir conditions of temperature and pressure.

atmospheric pressure The pressure exerted on the earth by the earth's atmosphere. A pressure of 760 mm of mercury or 101.3250 kPa is used as a standard for some measurements. State regulatory bodies have set other standards for use in measuring the legal volume of gas. Atmospheric pressure may also refer to the absolute ambient pressure at any given location.

Barrel A common English-unit measure of liquid volume which, in the petroleum industry, equals 42 U.S. liquid gallons for petroleum or natural gas liquid products measured at 60°F and equilibrium vapor pressure. One barrel equals 0.159 cubic meters, or 6.29 barrels per cubic meter.

blanket gas A gas phase maintained in a vessel containing liquid to protect the liquid against air contamination, to reduce the hazard of detonation, or to maintain pressure of the liquid. The source of the gas is external to the vessel.

blow case A small tank in which liquid is accumulated and then forced from the tank by applying gas or air pressure above the liquid level.

Blowdown The act of emptying or depressuring a vessel. This may also refer to discarded material, such as blowdown water from a boiler or cooling tower.

boilaway test Sometimes used to describe the GPA weathering test for LPgas. Refer to definition for "weathering test".

Bottoms The liquid or residual matter which is withdrawn from the bottom of a fractionator or other vessel during processing or while in storage.

B-P mix A liquefied hydrocarbon product composed chiefly of butanes and propane. If it originates in a refinery, it may also contain butylenes and propylene. More specifically, it

conforms to the GPA specifications for commercial B-P mixes as described in GPA Standard 2140.

Breathing The movement of vapor in or out of an atmospheric pressure storage tank because of a change of level of the stored liquid, a change in the temperature of the vapor space above the liquid, or a change of atmospheric pressure.

bs&w (basic sediment and water) Waste that collects in the bottom of vessels and tanks containing petroleum or petroleum products.

bubble point The temperature at a specified pressure at which the first stable vapor forms above a liquid.

butane, commercial A liquefied hydrocarbon consisting predominately of butane and/or butylene and which conforms to the GPA specification for commercial butane defined in GPA Standard 2140.

butane, normal In commercial transactions, a product meeting the GPA specifications for commercial butane and, in addition, containing a minimum of 95 liquid volume percent normal butane. Chemically, normal butane is an aliphatic compound of the paraffin series having the chemical formula C₄H₁₀ and having all of its carbon atoms joined in a straight chain.

Calorimeter An apparatus which is used to determine the heating value of a combustible material.

carbonyl sulfide A chemical compound of the aldehyde group containing a carbonyl group and sulfur (COS). Sometimes a contaminant in natural gas and NGL. It may need to be removed in order to meet sulfur specifications.

casinghead gas Unprocessed natural gas produced from a reservoir containing oil. It contains heavier hydrocarbon vapors and is usually produced under low pressure from a casing head on the well.

charcoal test A test standardized by the Gas Processors Association and the American Gas Association for determining the natural gasoline content of a given natural gas. The gasoline is adsorbed from the gas on activated charcoal and then recovered by distillation. The test is prescribed in Testing Code 101-43, a joint publication of AGA and GPA.

Chromatography A technique for separating a mixture into individual components by repeated adsorption and desorption on a confined solid bed. It is used for analysis of natural gas and NGL.

Claus Process A process to convert hydrogen sulfide into elemental sulfur by selective oxidation.

compressibility factor A factor, usually expressed as "Z," which gives the ratio of the actual volume of gas at a given temperature and pressure to the volume of gas when calculated by the ideal gas law.

compression ratio The ratio of the absolute discharge pressure from a compressor to the absolute intake pressure. Also applies to one cylinder of a reciprocating compressor and one or more stages of a rotating compressor.

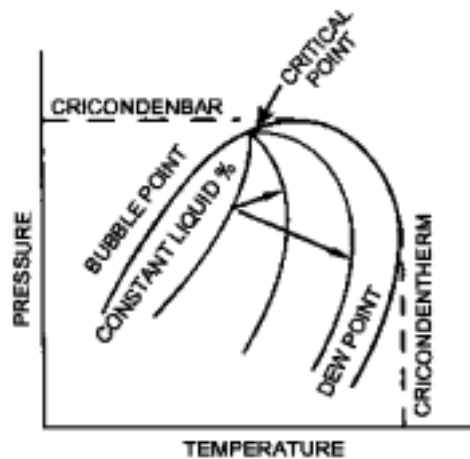
Condensate The liquid formed by the condensation of a vapor or gas; specifically, the hydrocarbon liquid separated from natural gas because of changes in temperature and pressure when the gas from the reservoir was delivered to the surface separators. In a steam system it may be water that is condensed and returned to the boilers.

convergence pressure The pressure at a given temperature for a hydrocarbon system of fixed composition at which the vapor-liquid equilibrium K-values of the various components in the system become, or tend to become, unity. The convergence pressure is used to adjust vapor-liquid equilibrium K-values to the particular system under consideration.

copper strip test A test using a small strip of pure copper to determine qualitatively the hydrogen sulfide corrosivity of a product. Refer to GPA LP-gas copper strip test (Copper Strip Method), ASTM D-1838 test procedure.

Cricondenbar The highest pressure at which liquid and vapor phases can exist at equilibrium in a multicomponent system.

Cricodentherm The highest temperature at which liquid and vapor phases can exist at equilibrium in a multicomponent system.



critical density The density of a substance at its critical temperature and critical pressure.

critical pressure The vapor pressure of a substance at its critical temperature.

critical temperature For a pure component, the maximum temperature at which the component can exist as a liquid.

cryogenic plant A gas processing plant which is capable of producing natural gas liquid products, including ethane, at very low operating temperatures, usually below minus 50°C.

cubic meter A unit of volume measurement commonly used in international commerce for petroleum, petroleum products and natural gas. One cubic meter measured at 15.56°C = 264.172 U.S. gallons = 6.29 barrels = 35.315 cubic feet measured at 15.56°C.

deaerator An item of equipment used for removing air or other non-condensable gases from a process stream or from steam condensate or boiler feed water.

Debutanizer A fractionator designed to separate butane (and more volatile components if present) from a hydrocarbon mixture.

Dehydration The act or process of removing water from gases or liquids.

demethanized product A product from which essentially all methane and lighter materials have been removed.

Demethanizer A fractionator designed to separate methane (and more volatile components if present) from a hydrocarbon mixture.

Depropanizer A fractionator designed to separate propane (and more volatile components if present) from a hydrocarbon mixture.

Desiccant A substance used in a dehydrator to remove water and moisture. Also a material used to remove moisture from the air.

Desulfurization A process by which sulfur and sulfur compounds are removed from gases or liquid hydrocarbon mixtures.

dew point The temperature at any given pressure, or the pressure at any given temperature, at which liquid initially condenses from a gas or vapor. It is specifically applied to the temperature at which water vapor starts to condense from a gas mixture (water dew point), or at which hydrocarbons start to condense (hydrocarbon dew point).

Distillation The process of separating materials by successively heating to vaporize a portion and then cooling to liquefy a part of the vapor. Materials to be separated must differ in boiling point and/or relative volatility.

doctor test A qualitative method for detecting hydrogen sulfide and mercaptans in NGL. The test distinguishes between "sour" and "sweet" products.

dry gas (1) Gas whose water content has been reduced by a dehydration process. (2) Gas containing little or no hydrocarbons commercially recoverable as liquid product. Gas in this second definition preferably should be called lean gas.

end point The maximum temperature observed on the thermometer during an ASTM distillation test.

EP-mix (ethane-propane mix) A product consisting of a mixture of essentially ethane and propane.

expansion turbine A device which converts part of the energy content of a gas or liquid stream into mechanical work by expanding the gas or liquid through a turbine from which work is extracted.

Extraction The process of transferring one or more components from one liquid phase to another by virtue of different solubility in the two liquids. It is also used to indicate removal of one or more constituents from a stream.

field separator A vessel in the oil or gas field for separating gas, hydrocarbon liquid, and water from each other.

flash point The lowest temperature at which vapors from a hydrocarbon liquid will ignite.

Fractionation See definition of "distillation." Generally used to describe separation of a mixture of hydrocarbons into individual products based on difference in boiling point and/or relative volatility.

freeze valve A specially constructed and calibrated valve designed and used solely for determining the water content in propane product.

gas constant (R) The constant multiplier in the Ideal Gas Law. Numerically, $R = PV/T$, if V is the volume of one mole of an ideal gas at temperature T and pressure P.

gas hydrate Refer to definition of "hydrate".

gas injection The injection of natural gas into a reservoir to maintain or increase the reservoir pressure or reduce the rate of decline of the reservoir pressure.

gas lift A method for bringing crude oil or water to the surface by injecting gas into the producing well bore.

gas-oil ratio (GOR) The ratio of gas to liquid hydrocarbon produced from a well. This may be expressed as standard cubic meters of gas per cubic meter of stock tank liquid.

gas processing The separation of constituents from natural gas for the purpose of making salable products and also for treating the residue gas to meet required specifications.

gas processing plant A plant which processes natural gas for recovery of natural gas liquids and sometimes other substances such as sulfur.

gas-well gas The gas produced or separated at surface conditions from the full well stream produced from a gas reservoir.

gas-well liquids The liquid separated at surface conditions from the full well stream produced from a gas reservoir.

gathering system The network of pipelines which carry gas from the wells to the processing plant or other separation equipment.

heat media (heating media) A material, whether flowing or static, used to transport heat from a primary source such as combustion of fuel to another material. Heating oil, steam, and an eutectic salt mixture are examples of heat media.

heating value (heat of combustion) The amount of heat obtained by the complete combustion of a unit quantity of material. The gross, or higher, heating value is the amount of heat obtained when the water produced in the combustion is condensed. The net, or lower, heating value is the amount of heat obtained when the water produced in the combustion is not condensed.

heavy ends The portion of a hydrocarbon mixture having the highest boiling point. Usually hexanes or heptanes and all heavier hydrocarbons are the heavy ends in a natural gas stream.

hexanes plus (or heptanes plus) The portion of a hydrocarbon fluid mixture or the last component of a hydrocarbon analysis which contains the hexanes (or heptanes) and all hydrocarbons heavier than the hexanes (or heptanes).

Hydrate A solid material resulting from the combination of a hydrocarbon with water under pressure.

Immiscible Liquids that will not mix nor blend to give homogeneity are said to be immiscible.

Inerts Elements or compounds not acted upon chemically by the surrounding environment. Nitrogen and helium are examples of inert constituents of natural gases.

Isobutene In commercial transactions, a product meeting the GPA specification for commercial butane and, in addition, containing a minimum of 95 liquid volume percent isobutane. Chemically, a hydrocarbon of the paraffin series with the formula C_4H_{10} and having its carbon atoms branched.

jacket water Water which fills, or is circulated through, a casing which partially or wholly surrounds a vessel or machine element in order to remove, add, or distribute heat in order to control the temperature within the vessel or element.

Joule-Thomson effect The change in gas temperature which occurs when the gas is expanded at constant enthalpy from a higher pressure to a lower pressure. The effect for most gases at normal pressure, except hydrogen and helium, is a cooling of the gas.

lead acetate test A method for detecting the presence of hydrogen sulfide by discoloration of paper which has been moistened with lead acetate solution.

lean gas (1) The residue gas remaining after recovery of natural gas liquids in a gas processing plant. (2) Unprocessed gas containing little or no recoverable natural gas liquids.

lean oil Absorption oil as purchased or recovered by the plant, or oil from which the absorbed constituents have been removed.

lift gas Gas used in a gas lift operation.

light ends The low-boiling, easily evaporated components of a hydrocarbon liquid mixture.

light hydrocarbons The low molecular weight hydrocarbons such as methane, ethane, propane and butanes.

LNG (liquefied natural gas) The light hydrocarbon portion of natural gas, predominately methane, which has been liquefied.

loading rack A structural and piping installation alongside a railroad track or roadway used for the purpose of filling railroad tank cars or transport trucks.

LPG (liquefied petroleum gas) Refer to definition of "LP-gas".

LP-gas (liquefied petroleum gas) Predominately propane or butane, either separately or in mixtures, which is maintained in a liquid state under pressure within the confining vessel.

LRG (liquefied refinery gas) Liquid propane or butane produced by a crude oil refinery. It may differ from LP-gas in that propylene and butylene may be present.

LTX (low temperature extraction unit) A unit which uses the cooling of a constant enthalpy expansion

to increase liquid recovery from streams produced from high pressure gas condensate reservoirs. Also called LTS (low temperature separation) unit.

Mercaptan Any of a homologous series of compounds of the general formula RSH. All mercaptans possess a foul odor.

miscible flood A method of secondary recovery of fluids from a reservoir by injection of fluids that are miscible with the reservoir fluids.

natural gas Gaseous form of petroleum. Consisting predominately of mixtures of hydrocarbon gases. The most common component is methane.

natural gasoline A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas, which meets vapor pressure, end point, and other specifications for natural gasoline as adopted by the GPA. See GPA Standard 3132.

natural gas processing plant Term used for gas processing plant, natural gasoline plant, gasoline plant, etc.

NGL (natural gas liquids) Natural gas liquids are those hydrocarbons liquefied at the surface in field facilities or in gas processing plants. Natural gas liquids include ethane, propane, butanes, and natural gasoline.

Odorant An odoriferous compound added to natural or LP-gas to impart a distinctive odor for detection of fugitive vapors. Ethyl mercaptan is the most widely used odorant for LP-gas, while tertiary butyl mercaptan, usually mixed with small amounts of other compounds, is the predominant odorant for natural gas.

oil-well gas Gas that is produced from an oil well.

on-stream factor The percentage of time a unit is on-stream.

operating factor The percentage of time a unit is performing the function for which it was designed.

Outage The vapor volume in a liquid vessel left for liquid expansion. Sometimes referred to as ullage.

packaged unit A shop-assembled group of equipment and accessories which needs only foundations, inlet and outlet piping, and utility connections to make an operating unit.

packed column A fractionation or absorption column filled with packing designed to give the required contact between the rising vapors and the descending liquid.

peak shaving The use of non-conventional fuels to supplement the normal supply of pipeline gas during periods of extremely high demand.

pentane-plus A hydrocarbon mixture consisting of isopentane (C₅H₁₂) and heavier components with higher boiling points.

Pigging A procedure for forcing a device through a pipeline for cleaning purposes, separating products, or inspecting the line.

pipeline gas Gas which meets a transmission company's minimum specifications.

Propane A normally gaseous paraffinic compound (C₃H₈). The term includes all products covered by GPA specifications for commercial and HD-5 propane. See GPA Standard 2140.

propane, commercial A liquefied hydrocarbon product consisting predominately of propane and/or propylene and which conforms to the GPA specification for commercial propane as defined in GPA Standard 2140.

propane HD-5 A special grade of propane consisting predominately of propane and which conforms to the GPA specification for HD-5 propane as defined in GPA Standard 2140.

raw gas Unprocessed gas, or the inlet gas to a gas processing plant.

raw mix liquids A mixture of natural gas liquids prior to fractionation. Also called "raw make".

Recovery That percent or fraction of a given component in the plant feed which is recovered as plant product.

Recycle Return of part of a process stream to a point upstream from where it was removed to enhance recovery or control.

Reflux In fractionation, the portion of condensed overhead returned to the column to enhance achievable purity of the overhead product.

reflux ratio A way of giving a relative measurement to the volume of reflux. Usually referred either to the feed or overhead product.

relative density The ratio of the mass of a given volume of a substance to that of another equal volume of another substance used as standard. Unless otherwise stated, air is used as the standard for gases and water for liquids, with the volumes measured at 15.56°C and atmospheric pressure (101.325 kPa).

relief system The system for safely relieving excess pressure to avoid exceeding equipment design pressure.

Residue The material which remains after a separation process. (1) Residue gas is that gas remaining after the recovery of liquid products. (2) Residue may also be the heaviest liquid or solid remaining after distillation or reclaiming process.

retrograde condensation (vaporization) Condensation or vaporization that is the reverse of expected behavior. Condensation caused by a decrease in pressure or an increase in temperature. Vaporization caused by an increase in pressure or a decrease in temperature.

rich gas Gas feed to a gas processing plant for liquid recovery.

rich oil The oil leaving the bottom of an absorber. It is the lean oil plus the absorbed constituents.

RVP (Reid Vapor Pressure) The vapor pressure of a material measured by the Reid Method and apparatus as detailed in ASTM Test Procedure D-323.

s & w (See bs&w)

saturated compounds Hydrocarbon compounds having no unsaturated carbon valence bonds. Natural gas and natural gas liquids are saturated compounds.

saturated liquid Liquid which is at its boiling point or is in equilibrium with a vapor phase in its containing vessel.

saturated vapor Vapor at its dew point.

Shrinkage The reduction in volume of a gas stream by removal of some of its constituents such as for recovered products, fuel, or losses.

SNG (Synthetic or Substitute Natural Gas) The gas product resulting from the gasification of coal and/or gas liquids or heavier hydrocarbons.

solution gas Gas which originates from the liquid phase in an oil reservoir.

Sour Liquids and gases are said to be "sour" if they contain hydrogen sulfide, carbon dioxide, and/or mercaptans above a specified level. It also is used to refer to the feed stream to a sweetening unit.

sour gas Gas containing undesirable quantities of hydrogen sulfide, mercaptans, and/or carbon dioxide. It also is used to refer to the feed stream to a sweetening unit.

Splitter A name applied to fractionators, particularly those separating isomers (e.g., butane splitter refers to a tower producing most of the isobutane in the feed as overhead and most of the normal butane in the feed as bottoms).

sponge absorbent An absorbent for recovering vapors of a lighter absorbent that is used in the main absorption process of a gas processing plant.

stabilized condensate Condensate that has been stabilized to a definite vapor pressure in a fractionation system.

Stabilizer A fractionation column designed to reduce the vapor pressure of a liquid stream.

stage separation system A system of separators where the liquid portion of the well effluent is separated from formation gas and flash vapors.

Still The column where the absorbed product is recovered from the lean absorption oil. In plants using a low molecular weight absorption oil, the still is designed as a fractionation column. In plants using a high molecular weight absorption oil, the still may use steam or other fluids as stripping medium. Also used to refer to regenerators in amine treating and glycol dehydration systems.

Strapping A term applied to the process of calibrating liquid storage capacity of storage tanks in increments of depth.

stream day A continuous 24 hour period of plant operation.

Stripper A column wherein absorbed constituents are stripped from the absorption oil. The term is applicable to columns using a stripping medium, such as steam or gas.

stripping factor An expression used to describe the degree of stripping. Mathematically, it is KV/L , the reciprocal of the absorption factor.

stripping medium As stated under "stripper", the medium may be steam, gas, or other material that will increase the driving force for stripping.

Sulfur A yellow, non-metallic chemical element. In its elemental state, it exists in both crystalline and amorphous forms. In many gas streams, sulfur may be found as volatile sulfur compounds, such as hydrogen sulfide, sulfur oxides, mercaptans, and carbonyl sulfide. Reduction of the concentration of these gaseous sulfur compounds is often necessary for corrosion control and possibly for health and safety reasons.

sulfur dioxide (SO₂) A heavy, colorless, suffocating gas that is chemically an oxide of sulfur. Conversion of the gaseous sulfur oxides to sulfur is necessary for corrosion control, for health and safety reasons, and for complying with governmental standards.

Sweet Gas containing essentially no objectionable sulfur compounds. Also, treated gas leaving a sweetening unit.

sweet gas Gas which has no more than the maximum sulfur and/or CO₂ content defined by (1) the specifications for the sales gas from a plant; (2) the definition by a legal body. Also, the treated gas leaving a sweetening unit.

temperature correction factor A factor for correcting volume at a given temperature to that at a specific reference temperature. Reference temperature most commonly used in the petroleum industry is 15.56°C.

therm A unit of gross heating value equivalent to $(1.055) \times 10^7$ kJ.

Tonne A unit of mass measurement, commonly used in international petroleum commerce; an expression for the metric ton, or 1000 kilograms.

trayed column A vessel wherein gas and liquid, or two partially miscible liquids, are contacted, usually concurrently on trays. Also refer to packed column.

Turboexpander Refer to definition of "expansion turbine."

ullage (See outage)

unsaturated compounds Hydrocarbon compounds having one or more unsaturated valence bonds, i.e., ethylene, propylene. These compounds are not found in natural gas streams or gas liquids because of their relatively high chemical reactivity. Unsaturation is produced by a thermal cracking or chemical reaction and can be found in synthetic gas (SNG) or light refinery gases (LRG).

vapor pressure (true vapor pressure) The pressure exerted by the equilibrium vapor of a liquid when confined in a closed previously evacuated tank or test apparatus.

vapor pressure gasoline A descriptive phrase for natural gasoline meeting a specified vapor pressure.

vapor pressure, GPA Vapor pressure as specified by GPA procedures.

vapor recovery Equipment or process for the recovery of desired components from stock tank vapors or vapors from some other source.

volatile sulfur An obsolete term referring to sulfur compounds that will vaporize readily.

Weathering The evaporation of liquid caused by exposing it to the conditions of atmospheric temperature and pressure. Partial evaporation of liquid by use of heat may also be called weathering.

weathering test A GPA test for LP-gas for the determination of heavy components in a sample by evaporation under specified conditions.

weight in air Weight compared to a standard with no correction for air buoyancy.

Wellhead The assembly of fittings, valves, and controls located at the surface and connected to the flow lines, tubing, and casing of the well so as to control the flow from the reservoir.

wet gas (1) A gas containing water, or a gas which has not been dehydrated. (2) A term synonymous with rich gas. Refer to definition of "rich gas".

A number proportional to the heat input to a burner at constant pressure
Widely used in Europe, the gross heating value of a gas divided by the square root of its gravity interchangeability of fuel together with a measured or calculated flame speed, to determine gases

Gas Processors Suppliers Association: برگرفته شده از: